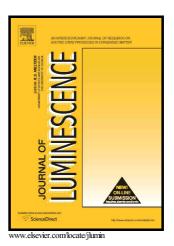
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ACCEPTED MANUSCRIPT

Optical properties of CH₃NH₃PbI₃ single crystal

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Abstract

CH₃NH₃PbI₃ single crystals were successfully grown from HI solution by cooling method, and their

structure were studied by X-ray diffraction. The Eg value of CH₃NH₃PbI₃ single crystal determined by

transmission spectrum was 1.51eV. Low-temperature photoluminescence spectra of

CH₃NH₃PbI₃ single crystal show that a phase transition occurs at 160K, the luminescence mechanism

might be the intrinsic transition. And with the temperature rising, the "Varshni" trend is observed in

CH₃NH₃PbI₃ single crystal, indicating the change of Eg with temperature. Additionally, the Eg value

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